



Unit 1: Introduction to Anatomy and Physiology

Human Anatomy and
Physiology

Pleasant Valley High School



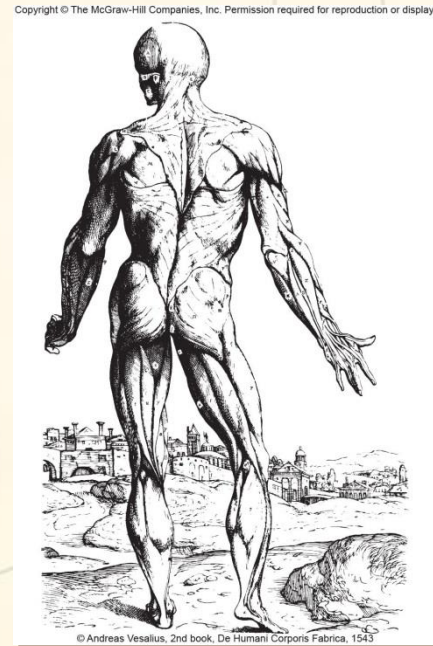
Important Word Parts

- Append – pertaining to limbs
- Cardi- heart
- Cran- head
- Dors- back
- Homeo- same
- Meta- change
- Pariet- wall
- Pelv- basin
- Peri- around
- Pleur- rib
- -stasis – standing still
- -tomy – cutting



1.1 Introduction

- Throughout history, healers have tried to fix ailments in the human body
- Scientific breakthroughs made the study of the human body a focus of science.





1.2 Anatomy and Physiology

- Anatomy is the branch of science that deals with the structure (morphology) of body parts and how they are organized.
- Physiology concerns how and why the body parts do what they do.
- Topics are inseparable due to their overlap with one another.



1.3 Characteristics of Life

- Movement
- Responsiveness
- Growth
- Reproduction
- Respiration
- Digestion
- Absorption
- Circulation
- Assimilation
- Excretion



1.4 Maintenance of Life

- Requirements of Organisms for Survival
 - Water – required in almost all metabolic processes, most abundant chemical in body, transport fluid
 - Foods – provide nutrients, used for energy, can regulate vital chem. rxns



- Oxygen – makes up 20% of air, used to release food energy, drives metabolic processes
- Heat – product of metabolism, more heat = faster metabolism
- Pressure – important for aerobic processes, air pressure allows aerobic respiration

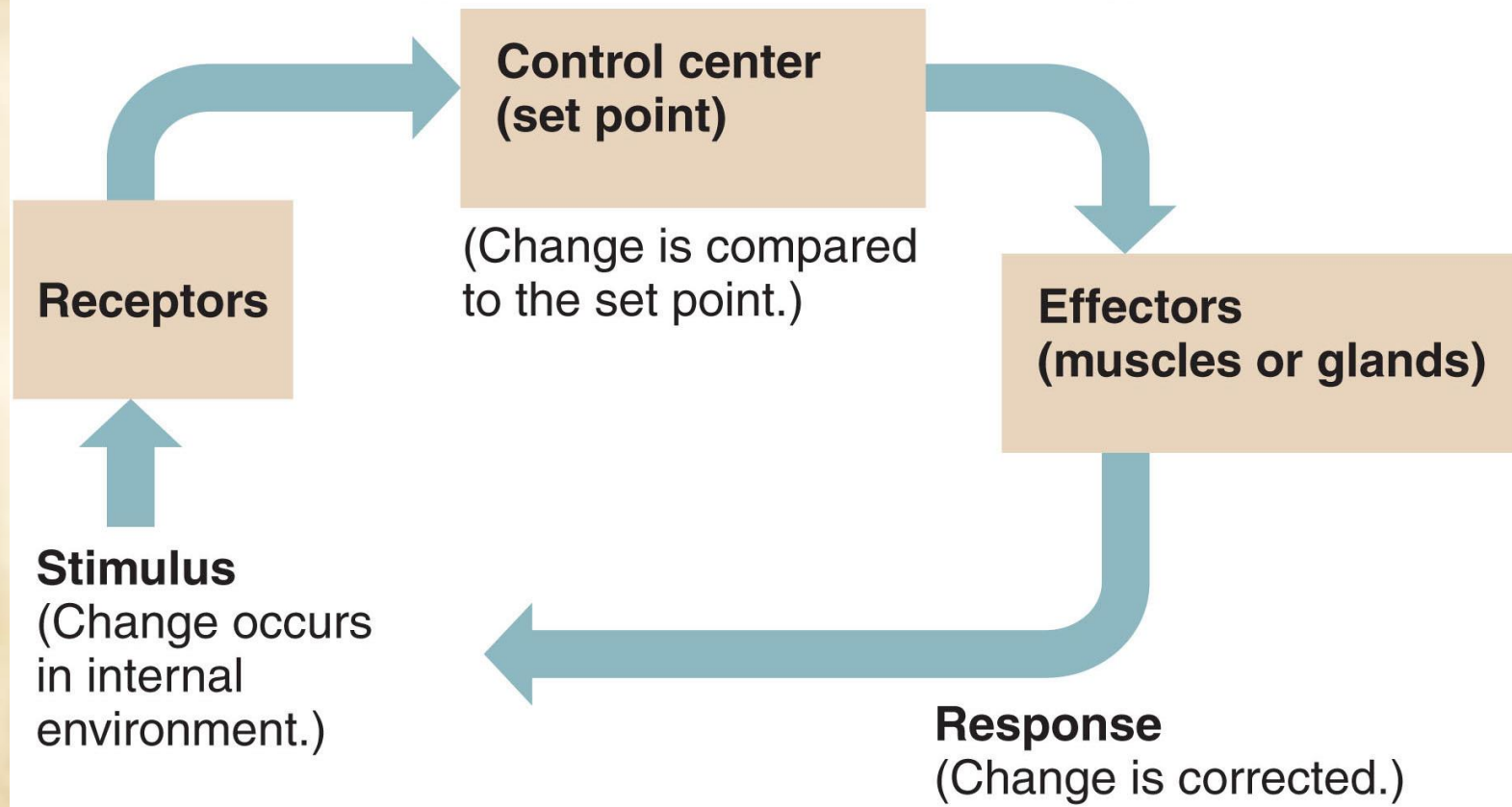


Homeostasis

- The ability for the body to maintain its internal environment
- 3 homeostatic mechanisms
 - Receptors
 - Set Points
 - Effectors



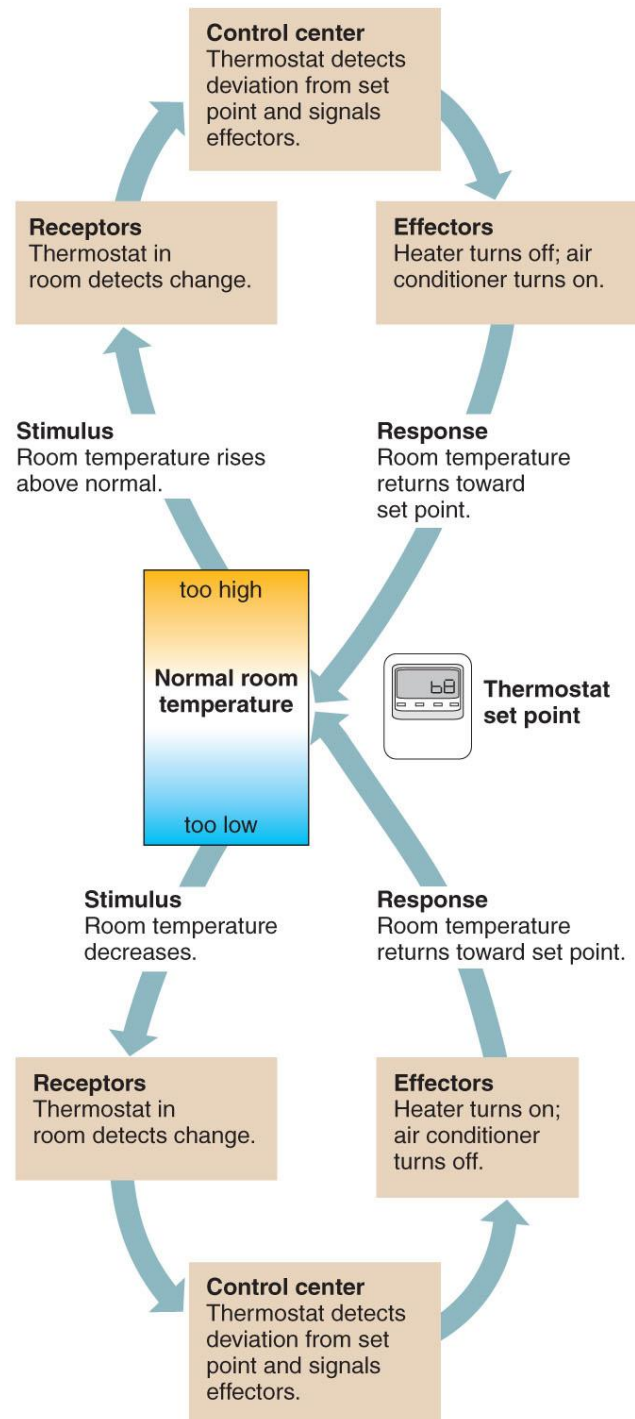
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Real World Application

- Vital Signs
 - Doctors and nurses check for vital signs (BP, Temp, Weight, Height, etc)
 - These are metabolic products that indicate that body functions are working properly
 - Vitals are seen in all LIVING persons





1.5 Levels of Organization

- In General Biology, you learned about the cell through the organism
- In Physical Science, you learned about the atom and molecules
- In A&P you will combine the two skill sets to form macromolecules that make up cells

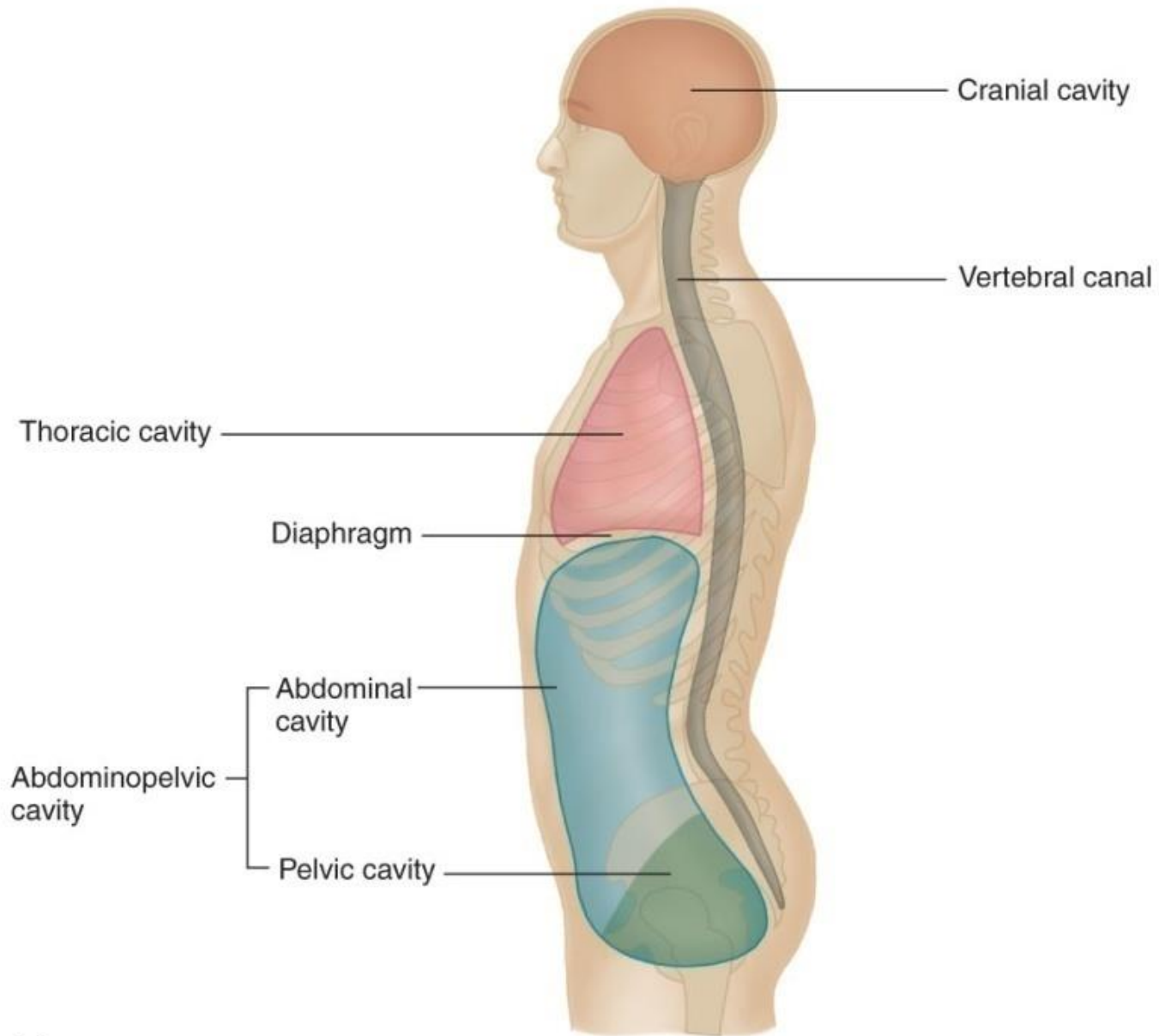


1.6 Organization of the Human Body

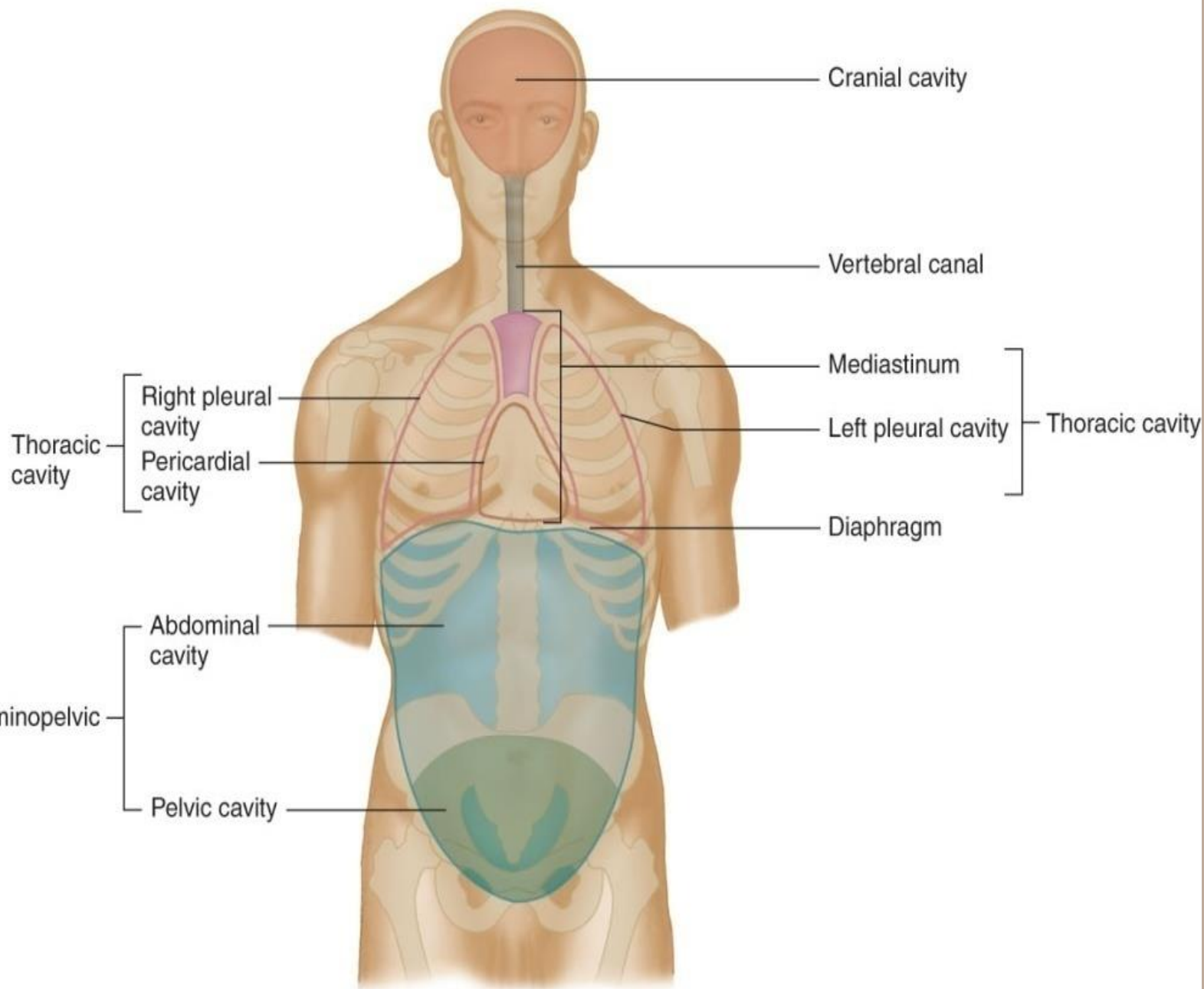
- Body Cavities
 - Axial Portion
 - Dorsal Cavity
 - Cranial Cavity
 - Vertebral Canal



- **Ventral Cavity**
 - **Thoracic Cavity**
 - » Upper and lower portions separated by diaphragm
 - » Upper portion is split by the mediastinum
 - **Abdominopelvic cavity**
 - » **Pelvic Cavity** – enclosed by the hip bones
 - » **Abdominal Cavity** – includes stomach, liver, spleen, gallbladder, kidneys, and most of the intestines



(a)



(b)



- Small head cavities
 - Oral
 - Nasal
 - Sinuses
 - Orbital
 - Eyes
 - Middle Ear



Thoracic and Abdominopelvic Membranes

- Parietal Membrane
- Visceral Membrane
- Pleural Membrane
- Pericardial Membrane
- Peritoneal Membrane



Organ Systems

- Integumentary System
 - Body covering
 - Includes skin, hair, nails, sweat glands, and sebaceous glands



- **Support and Movement**
 - **Skeletal System**
 - Bones, cartilage, protects softer tissues, provides rigid structure
 - **Muscular System**
 - Contract and pull, provide forces that allow body movements, maintain posture, provide body heat



- **Integration and Coordination**
 - **Nervous System**
 - Brain, spinal cord, nerves, and sensory organs
 - **Endocrine System**
 - Glands that secrete hormones, hormones travel through blood, reach target cells and cause chemical reactions



- **Transport**
 - **Cardiovascular**
 - Heart, arteries, veins, capillaries, blood
 - **Lymphatic**
 - Sometimes seen as part of the cardio system
 - Lymphatic vessels, lymph nodes, lymph fluids, thymus gland, spleen



- **Absorption and Excretion**
 - **Digestive**
 - Mouth all the way to the large intestine
 - **Respiratory**
 - Nasal, pharynx, larynx, trachea, bronchi, lungs
 - **Urinary**
 - Kidneys, bladder, ureter, bladder, urethra
 - Remove waste from the blood and maintain water levels



- **Reproduction**
 - Progeny
 - Male and female versions



1.7 Anatomical Terminology

- Superior – closer to the head than another part
 - Ex. The thoracic cavity is superior to the abdominopelvic cavity
- Inferior – part is below another or farther from the head
 - Ex. Neck is inferior to the orbital



- Anterior – towards the front
 - Think antlers, they are in the front of an organism
 - May be called *ventral*
- Posterior – towards the back
 - May be called *dorsal*



- Imagine a line of symmetry down the body
 - Medial
 - A body part is medial if it is closer to this line than another
 - Lateral
 - Means towards the side
 - Ex. The ears are lateral to the eyes



- Proximal
 - A part is closer to an attachment point than another
- Distal
 - A part is farther from an attachment point than another

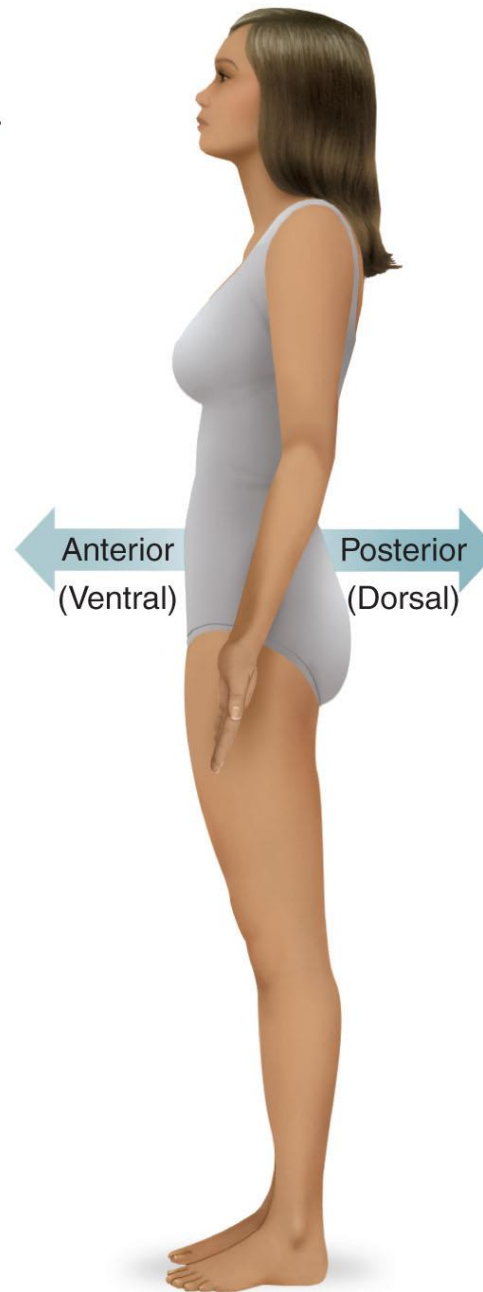
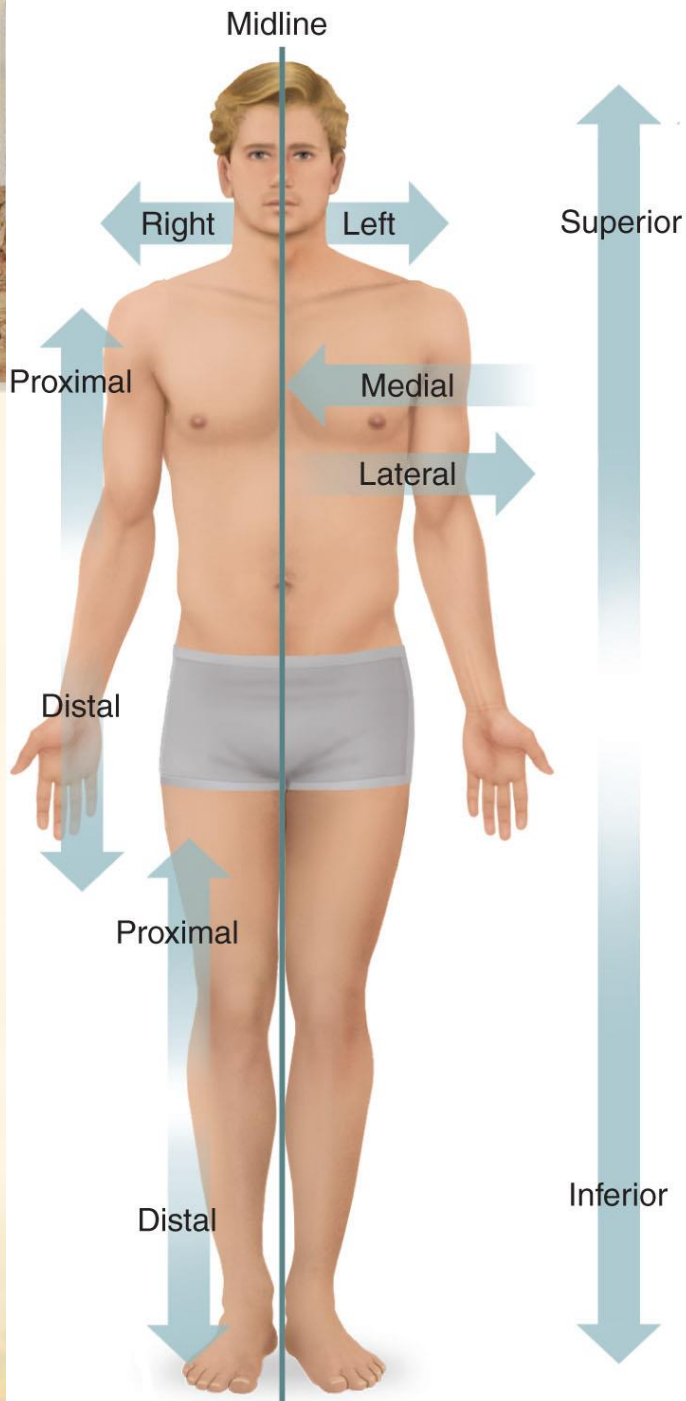


- Superficial
 - Situated near the surface
 - Can be called *peripheral*
 - Indicated position of blood vessels and nerve
- Deep
 - Parts that are more internal



Body Sections

- Can be referred to as Planes
 - Sagittal
 - Refers to a lengthwise cut that would run along the mediastinum
 - Transverse
 - Horizontal plane, cuts the body into superior and inferior portions
 - Coronal
 - Called *frontal*, cuts the body into anterior and posterior





Body Regions

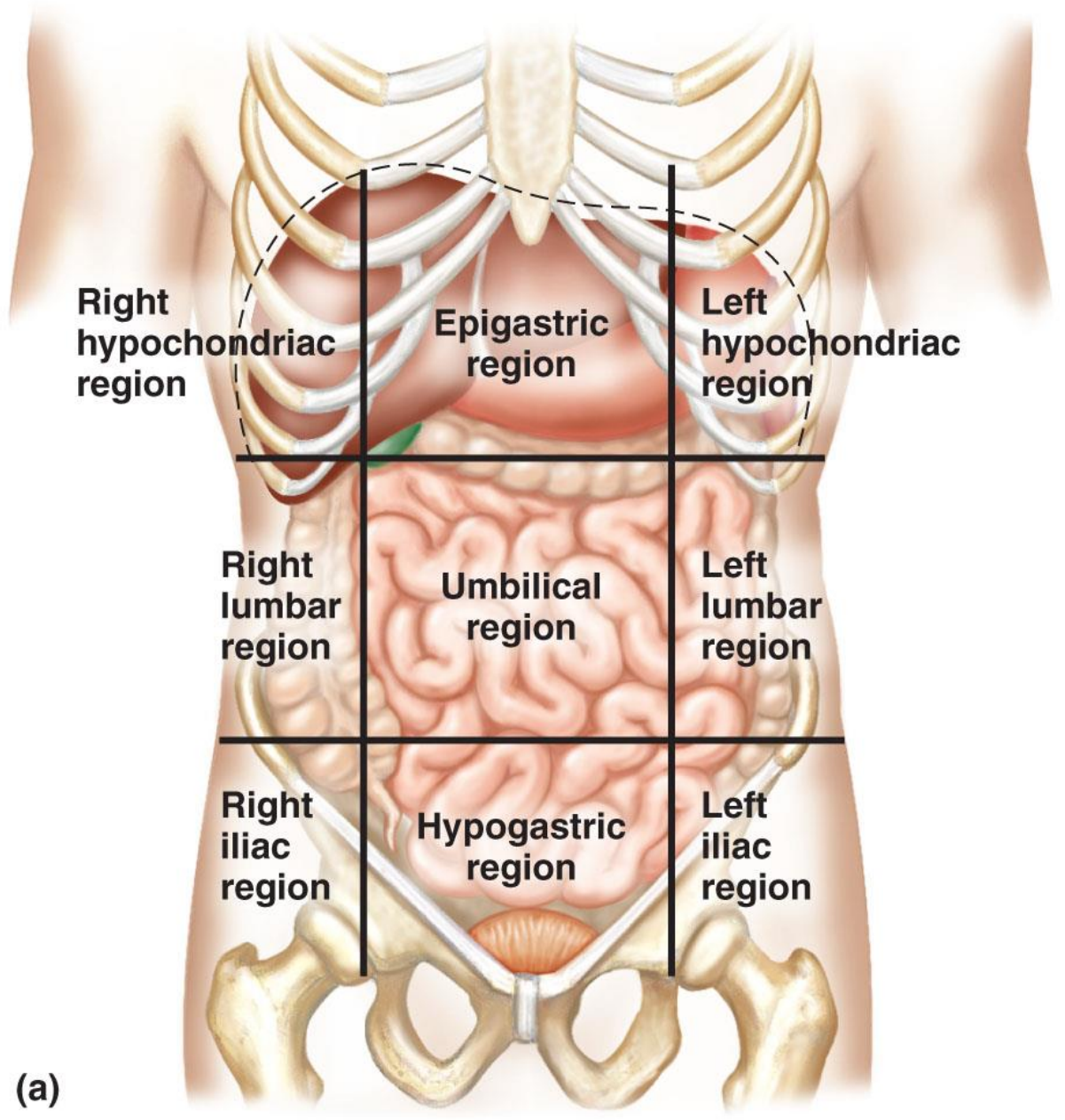
- Epigastric – refers to the upper middle region
- Left hypochondriac region – left side of the epigastric
- Right hypochondriac region – right side of the epigastric



- Umbilical Region – the middle portion
- Left Lumbar Region – left of the umbilical region
- Right Lumbar Region – right of the umbilical region



- Hypogastric Region – lower middle portion
- Left and right iliac regions – to the left or right of the hypogastric region
 - Can be referred to as *inguinal regions*



(a)



Sections

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- Cross Section
- Oblique Section
- Longitudinal Section



(a)



(b)



(c)



Specific Regions Practice

- <http://www.wisc-online.com/Objects/ViewObject.aspx?ID=AP15405>

